CLAIMS

1. (previously presented) A multiple channel array coil for magnetic resonance imaging, comprising:

a cylindrically tapered head portion, said head portion including a plurality of individual coil elements each associated with an individual channel, said individual coil elements of said head portion arranged so as to define a smaller diameter at a superior end of said head portion then with respect to a diameter at an inferior end of said head portion; and

a chest portion, said chest portion further comprising a generally planar anterior section and a generally planar posterior section, both said anterior section and said posterior section including a plurality of individual coil elements each associated with an individual channel.

2. (original) The array coil of claim 1, wherein:

each of said plurality of individual coil elements within said head portion are geometrically spaced apart from an adjacent coil element thereto in a non-overlapping configuration; and

each of said plurality of individual coil elements within said chest portion are geometrically spaced apart from an adjacent coil element thereto in a non-overlapping configuration.

3. (previously presented) The array coil of claim 2, wherein each of said plurality of individual coil elements within said head portion and said chest portion are isolated from nearest neighbor coil elements by transformer decoupling without the use of a capacitive network.

4. (original) The array coil of claim 3, wherein each of said plurality of individual coil elements is isolated from next-nearest neighbor coil elements by preamplifier decoupling.

5. (original) The array coil of claim 1, further comprising 8 individual coil elements within said head portion and 8 individual coil elements within said chest portion.

6. (previously presented) A multiple channel array coil for magnetic resonance imaging, comprising:

a cylindrically tapered head portion, said head portion including a plurality of individual coil elements each associated with an individual channel, said individual coil elements of said head portion arranged so as to define a smaller diameter at a superior end of said head portion then with respect to a diameter at an inferior end of said head portion;

a chest portion, said chest portion further comprising a generally planar anterior section and a generally planar posterior section, both said anterior section and said posterior section including a plurality of individual coil elements each associated with an individual channel; and

a hinge assembly, said hinge assembly enabling said anterior section of said chest portion to be rotated about a left-right axis and translated in a vertical axis of the array coil.

7. (original) The array coil of claim 6, wherein:

each of said plurality of individual coil elements within said head portion are geometrically spaced apart from an adjacent coil element thereto in a non-overlapping configuration; and

each of said plurality of individual coil elements within said chest portion are geometrically spaced apart from an adjacent coil element thereto in a non-overlapping configuration.

8. (previously presented) The array coil of claim 7, wherein each of said plurality of individual coil elements within said head portion and said chest portion are isolated from nearest neighbor coil elements by transformer decoupling without the use of a capacitive network.

9. (original) The array coil of claim 8, wherein each of said plurality of individual coil elements is isolated from next-nearest neighbor coil elements by preamplifier decoupling.

10. (original) The array coil of claim 6, further comprising 8 individual coil elements within said head portion and 8 individual coil elements within said chest portion.

11. (previously presented) A magnetic resonance imaging (MRI) system, comprising:

a computer;

a magnet assembly for generating a polarizing magnetic field;

a gradient coil assembly for applying gradient waveforms to said polarizing magnetic field along selected gradient axes; and

a radio frequency (RF) transceiver system for applying RF energy to excite nuclear spins of an object to be imaged, and for thereafter detecting signals generated by excited nuclei of said object to be imaged, said RF transceiver system further comprising:

a multiple channel array coil having a cylindrically tapered head portion and a chest portion;

said head portion including a plurality of individual coil elements each associated with an individual channel, said individual coil elements of said head portion arranged so as to define a smaller diameter at a superior end of said head portion then with respect to a diameter at an inferior end of said head portion; and

said chest portion further comprising a generally planar anterior section and a generally planar posterior section, both said anterior section and said posterior section including a plurality of individual coil elements each associated with an individual channel;

wherein signals detected by said multiple channel array coil are processed by said computer to produce MR images of said object to be imaged.

12. (original) The MRI system of claim 11, wherein said multiple channel array coil is configured for sensitivity encoding (SENSE) imaging techniques.

13. (original) The MRI system of claim 11, wherein:

each of said plurality of individual coil elements within said head portion are geometrically spaced apart from an adjacent coil element thereto in a non-overlapping configuration; and

each of said plurality of individual coil elements within said chest portion are geometrically spaced apart from an adjacent coil element thereto in a non-overlapping configuration.

14. (previously presented) The MRI system of claim 13, wherein each of said plurality of individual coil elements within said head portion and said chest portion are isolated from nearest neighbor coil elements by transformer decoupling without the use of a capacitive network.

15. (original) The MRI system of claim 14, wherein each of said plurality of individual coil elements within said head portion and said chest portion is isolated from next-nearest neighbor coil elements by preamplifier decoupling.

16. (original) The MRI system of claim 11, further comprising 8 individual coil elements within said head portion and 8 individual coil elements within said chest portion.

17. (previously presented) A method for configuring a multiple channel array coil suitable for use in sensitivity encoding for magnetic resonance imaging (MRI), the method comprising:

arranging a first set of individual coil elements into a cylindrically tapered head portion each associated with an individual channel, said individual coil elements of said head portion arranged so as to define a smaller diameter at a superior end of said head portion then with respect to a diameter at an inferior end of said head portion; and

arranging a second and a third set of individual coil elements into a chest portion, said chest portion further comprising a generally planar anterior section including said second set of individual coil elements each associated with an individual channel and a generally planar posterior section including said third set of individual coil elements each associated with an individual channel.

18. (original) The method of claim 17, wherein:

each of first set of individual coil elements within said head portion are geometrically spaced apart from an adjacent coil element thereto in a non-overlapping configuration; and

each of said second and third sets of individual coil elements within said chest portion are geometrically spaced apart from an adjacent coil element thereto in a non-overlapping configuration.

19. (previously presented) The method of claim 13, further comprising isolating each individual coil element in said first, second and third sets from nearest neighbor coil elements by transformer decoupling without the use of a capacitive network.

20. (original) The method of claim 19, further comprising isolating each individual coil element in said first, second and third sets from next-nearest neighbor coil elements by preamplifier decoupling.

21. (original) The method of claim 17, further comprising arranging 8 individual coil elements within said head portion, and 4 individual coils within both said anterior and posterior sections of said chest portion.

22. (previously presented) A method for implementing sensitivity encoding for magnetic resonance imaging (MRI), the method comprising:

generating a polarizing magnetic field;

applying gradient waveforms to said polarizing magnetic field along selected gradient axes; and

applying RF energy generated by an RF transceiver system to excite nuclear spins of an object to be imaged, and thereafter detecting signals generated by excited nuclei of said object to be imaged, wherein said RF transceiver system further includes:

a first set of individual coil elements arranged into a cylindrically tapered head portion each associated with an individual channel, said individual coil elements of said head portion arranged so as to define a smaller diameter at a superior end of said head portion then with respect to a diameter at an inferior end of said head portion; and

a second and a third set of individual coil elements arranged into a chest portion, said chest portion further comprising a generally planar anterior section including said second set of individual coil elements each associated with an individual

channel and a generally planar posterior section including said third set of individual coil elements each associated with an individual channel.

23. (original) The method of claim 22, wherein:

each of first set of individual coil elements within said head portion are geometrically spaced apart from an adjacent coil element thereto in a non-overlapping configuration; and

each of said second and third sets of individual coil elements within said chest portion are geometrically spaced apart from an adjacent coil element thereto in a non-overlapping configuration.

24. (previously presented) The method of claim 23, further comprising isolating each individual coil element in said first, second and third sets from nearest neighbor coil elements by transformer decoupling without the use of a capacitive network.

25. (original) The method of claim 23, further comprising isolating each individual coil element in said first, second and third sets from next-nearest neighbor coil elements by preamplifier decoupling.

26. (previously presented) The method of claim 22, wherein said RF transceiver system further includes a 16-channel, neurovascular array coil.